Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **Savannah River** Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site** HQ ID: **0073**

Project **SR-SF06 / Alternate Technology Project**

General Project Information

Project Description Narratives

Purpose, Scope, and Technical Approach:

In 1992, the Secretary of Energy directed the Assistant Secretary for Environmental Restoration and Waste Management (EM) to develop an integrated, long-term Spent Nuclear Fuel (SNF) management program. In response, EM initiated the development of a DOE-owned SNF program to define and ensure resolution of all associated issues starting with the quantification of DOE SNF inventories and fuel storage facilities. The purpose of the DOE-owned SNF program is to integrate DOE`s existing SNF activities into one program to better control and manage this material, and to ensure that all issues associated with SNF are resolved in a safe and cost effective manner.

The Programmatic Spent Nuclear Fuel Management and Idaho final EIS ROD was issued on May 30, 1995. Key impacts from this document include a provision to consolidate aluminum clad SNF at SRS by means of shipping FRR SNF assemblies, as well as those from US Universities, other DOE sites, and other US Government sites.

The Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel Environmental Impact Statement Record of Decision was issued on May 13, 1996. Key impacts from this document include a provision to return about 17,800 FRR SNF assemblies to SRS between 1996 and 2009, although that number has since been reduced due to some foreign countries electing not to participate as originally thought.

The activities of this project, the management of the receipts and transfer portion of the SNF Program and the technologies developed and recommended for the Treatment (TSF) and Storage Facility are crucial to the program`s overall success.

The "Alternate Technologies" project is required to implement the actions described in the Record of Decision for the Final Environmental Impact Statement of the Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel, the ROD for the FRR EIS. This project combines several of the National Spent Nuclear Fuel Program strategic objectives planned for the Savannah River Site (SRS). The successful completion of these objectives will allow the United States and DOE to meet several foreign and domestic policy initiatives: reduce processing as the sole method for stabilizing and disposing of spent nuclear fuels, meet International Atomic Energy Agency agreements and commitments, meet DOE commitments under the Idaho Spent Fuel Programmatic EIS and Record of Decision, satisfy public health and safety concerns, reduce the existing facility vulnerabilities by replacement and reduce risks associated with nuclear material proliferation. Ultimately this material will be disposed of in a technologically and environmentally sound manner.

This project includes the activities in support of the overall program development of technologies to be included in facilities that will be needed to manage Spent Nuclear Fuel at SRS. It provides cost effective sharing of best practices through integration of SRS programs with DOE-complex-wide programs, other DOE sites, and industry, and ensures timely development of site-specific NEPA documentation. It also provides technical advice to DOE-HQ on Spent Nuclear Fuel (SNF) program issues and provides funding for identification and development of treatment requirements and packaging technologies to allow disposal of spent nuclear fuel in a geological repository.

The principal scope elements include the development of a new technology to package and/or treat the spent nuclear fuel into a form ready for transportation and acceptable to a geological repository. The new technology must include adequate technical development to satisfy standards and

Project Description Narratives

requirements of the Nuclear Regulatory Commission for the dry storage of aluminum based Research Reactor Spent Nuclear Fuel pending shipment for final disposal. The waste form must be consistent with the requirements that are being developed by DOE-RW and its subcontractors for safe disposal of spent nuclear fuel in a geological repository.

Consistent with the guidance from the Deputy Assistant Secretary for Nuclear Material and Facility Stabilization Environmental Management and the report of the Research Reactor Spent Nuclear Fuel Task Team the following items are included:
- Conceptual development of two (2) technologies to be used in conjunction with packaging for co-disposal with defense high level waste (i.e. direct disposal and/or melt and dilute treatment)
- The evaluation, through the NEPA process, of those few fuel types that present difficult technical challenges for simple treatment (currently estimated to be about three percent of the total SRS volume, e.g. K, L, RBOF basin inventories) that may require stabilization in existing Savannah River Site Facilities.

The technology development activities will include laboratory activities, bench scale facilities, and demonstration projects. A pilot-scale melt-dilute facility (furnace) will be designed, procured and installed in L-Area in FY99 and be ready for cold run testing in FY00, followed by testing with irradiated SNF. Testing analysis of melt-dilute process in pilot scale facility will continue in FY01. This activity will also work with DOE-RW and the Nuclear Regulatory Commission to insure the Spent Nuclear Fuel is packaged consistent with geological repository requirements.

Activities required by the National Environmental Policy Act are provided for in this project. The Notice of Intent for the SRS Site-specific Spent Nuclear Fuel EIS was signed on December 23, 1996 and released to the public in the Federal Register on December 31, 1996. Key decisions from this document will determine the treatment technology used in conjunction with the Transfer and Storage Service and the basis for determining the facility size.

Other activities related to the Alternative Technology project development include waste acceptance studies, qualified road-ready canister specification development and the evaluation of alternative disposition options, e.g.direct/co-disposal of HEU, dilution of HEU w/depleted Uranium.

Project Status in FY 2006:

The technology development activities in support of treatment and storage requirements are essentially complete by this date. Receipts of Foreign and Domestic Research Reactor, and DOE Aluminum Clad Fuel will continue. An end date for shipments to the repository beyond FY 2035, the date cited in the FY96 Baseline Environmental Management Report, has not been identified. The majority of FRR will have been received by this time. The Treatment and Storage Facility will be operational.

Post-2006 Project Scope:

Not Applicable

Project End State

The final endstate for the Alternative Technology Development project will be achieved when the alternate technology recommendation is made for the SRS SNF Management EIS, the technology is deployed as part of the Transfer and Storage Service, and the repository accepts the SNF. The Record of

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Savannah River**

Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site**

HQ ID: **0073**

Project **SR-SF06 / Alternate Technology Project**

Project Description Narratives

Decision will determine the technology implemented and the repository acceptance will be determined by NRC approval of the repository license.

Cost Baseline Comments:

Note: A site critical issue in FY00 is a delta of $4,337K from the Alternate Technology Target. While the Treatment and Storage Facility may represent a potential funding source, movement of
of dollars from TSF to Alternate Technology may require some reprogramming action. However, due to the ongoing evaluation of TSF scope, particularly related to potential safety analysis and technical requirements, we will for now preserve these dollars in the TSF estimates.
The financial figures for the Path to Closure (PtC) were derived using the SRS FY99 Annual Operating Plan (AOP) as the beginning basis. Outyear budget (OYB) requirements were estimated by factoring Detailed Information Input Forms (DIIF's) and outyear program planning assumptions/schedules against this AOP baseline. The OYB process utilizes the program requirements contained in the DOE Strategic Execution Guidance (SEG) as the formulation basis of detailed program/operating assumptions and Program Planning Packages used to communicate scope of work requirements to other SRS divisions, e.g. Construction, Waste Management, Environment, Safety & Health, etc. Financial estimates are generated by the line and support organizations using the DIIF system. Estimates were escalated for anticipated inflation using a 3.6% factor for FY00and 01, and 2.7% for FY02 and beyond - per the guidance from the site.

The 1999 planned accomplishments may change based on the requirements contained in the SRS SNF Management EIS ROD. A portion ($5.0 million) of the FY2000 funding requirement will need to be accelerated into FY1999 if the Melt and Dilute Technology is recommended as the preferred alternative in the SRS SNF Management EIS ROD. The schedule for deployment of the process in the TSF can only be maintained if this funding is shifted to FY1999. The schedule for deployment is not recoverable by the application of increased resources at a later time.

The full cost of PBS work scope may change based on the authorized funding and priorities in any given year due to changes in site overhead assumptions. For planning and budgeting purposes, work scope costs were estimated using site overhead rates sized for clearance at a funding target of $1,222.5 million. For FY2001 (the budget year), the site overhead is applied and cleared at the funding target, while the work scope below the funding target (planning level) is incremental direct cost. For FY2002, the site overhead is applied and cleared over the total planning level of scope.

Safety & Health Hazards:

A formal risk analysis has not been performed at this time. This project supports the activities to determine the relative merits and resolve technical concerns for the alternatives for spent nuclear fuel disposal that have historically been provided by canyon processing. The activities are conducted at facilities both on and off-site. The work performed in L-Area is enveloped by the description of L-Area SF02. The work performed at the SRTC facilities are covered by the applicable SRTC Laboratory procedures and documents. The work provided at other facilities within the DOE complex are covered by the ES& H requirements described in the fund transfer documents.

The results of the Alternate Technologies program will be to provide DOE with the information that will be used in making a decision on the appropriate technology to replace existing processing. If a decision is reached to construct a new facility to provide the treatment, SF09 Transfer and Storage Facility describe the health and safety aspects.

Safety & Health Work Performance:

Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **Savannah River** Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site** HQ ID: **0073**

Project **SR-SF06 / Alternate Technology Project**

Project Description Narratives

As described in DOE`s, "Safety Management System Policy," P450.4, there are six primary components that must be implemented; Objective, Principles, Functions, Implementation, Responsibilities, and Mechanisms. In adopting these components into the WSRC program, WSRC developed the Safety Management System Policy MP1.22, "Integrated Standards Based Safety Management Program," and submitted to the DOE (WSRC letter ESH-97-0004, F. B. Davis to L. C. Sjostrom, "Schedules for Implementation of a Safety Management System (SMS) (U)," dated March 17, 1997) WSRC-IM-97-10, Rev.0, "Safety Management System Description (U), " These documents describe the Safety Management System used to ensure safety is integrated into work performed under WSRC`s Contract No. DE-AC09-96SR1850.

WSRC will comply with the WSRC Integrated Management System Description. The conditions and requirements will be clearly established and agreed upon prior to the starting of any project and those requirements will be contractually binding upon WSRC. The key elements of the WSRC Integrated Safety Program are to define the scope of work, identify and analyze hazards associated with the work, develop and implement hazard controls, perform work within controls, and provide feedback on adequacy of controls and continue to improve safety management. The WSRC Integrated Procedures Management System is the primary mechanism for implementing the objective, principles and functions of the Safety Management System. This system establishes Company-Level, Division-level, and Program-specific procedures consistent with organizational roles, and ensures a consistent, discipline site-wide approach to safety while performing work.

PBS Comments:

In 1992, the Secretary of Energy directed the Assistant Secretary for Environmental Restoration and Waste Management (EM) to develop an integrated, long-term Spent Nuclear Fuel (SNF) management program. In response, EM initiated the development of a DOE-owned SNF program to define and ensure resolution of all associated issues starting with the quantification of DOE SNF inventories and fuel storage facilities. The purpose of the DOE-owned SNF program is to integrate DOE`s existing SNF activities into one program to better control and manage this material, and to ensure that all issues associated with SNF are resolved in a safe and cost effective manner.

The Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel Environmental Impact Statement Record of Decision was issued on May 13, 1996. Key impacts from this document include a provision to return about 17,800 FRR SNF elements to SRS between 1996 and 2009.

The Programmatic Spent Nuclear Fuel Management and Idaho final EIS ROD was issued on May 30, 1995. Key impacts from this document include a provision to consolidate aluminum clad SNF at SRS by means of shipping FRR SNF elements, as well as those from US Universities, other DOE sites, and other US Government sites.

The activities of this project, the management of the receipts and transfer portion of the SNF Program and the technologies developed and recommended for the Transfer and Storage Facility are crucial to the program`s overall success. Availability of the proposed Transfer and Storage service during FY 2005 is pivotal to achieving efficient and timely deinventory and retirement of L-Basin and RBOF in FY 2010 and FY 2011, respectively. Delay would require extending operations in L-Basin and RBOF at approximately $50 million per year (FY97 Dollars), plus costs (approximately $45K/cask) for double-handling SNF through RBOF or L-Basin and into dry storage.

Baseline Validation Narrative:

Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **Savannah River** Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site** HQ ID: **0073**

Project **SR-SF06 / Alternate Technology Project**

Project Description Narratives

Although no formal budget validation has been performed by independent organizations, the SRS aluminum alternate technology program has been reviewed and endorsed by a number of external review commitees e.g. the NAS, NWTRB, NRC, DNFSB, SNL etc.

The National Academy of Science of the National Research Council conducted a thorough review of the DOE technology screening process and of the SRS technology development process. They endorsed the program tasks as being appropriate and reasonable and the technology itself to be feasible.

The program is also under continuing review by the U.S. Nuclear regulatroy Commission (USNRC). They have also concluded that the SNF forms identified by SRS are sutiable for disposal in the respository. They conducted a detailed technical reviews and identified a number of technical issues for further investogations. Resolution of these issues have been incorporated in the Alternate Technology program for the outyears.

In addition, the program and the development of Melt-Dilute form has been reviewed by the Nuclear Waste Technical Review Board (NWTRB). The NWTRB has also acknowledged that the melt-dilute form is ideally suited for disposal in the repository. Routine reviews are also held with the defense Nucelar Safety Board (DNFSB). Further, a technology decision analysis was also conducted independtly by Sandia National Lab (SNL) on behalf of DOE and the results valiated the SRS analysis. Finally, the technology program is also the basis of the draft EIS which has been presented to the public and the stakeholders.

General PBS Information

Project Validated? **Date Validated:**

Has Headquarters reviewed and approved project? Yes

Date Project was Added: 12/1/1997

Baseline Submission Date: 7/3/1999

FEDPLAN Project? Yes

Drivers:

CERCLA	RCRA	DNFSB	AEA	UMTRCA	State	DOE Orders	Other
N	N	N	N	N	N	Y	Y

Project Identification Information

DOE Project Manager: Sandra L. Johnson

DOE Project Manager Phone Number: 803-557-3828

DOE Project Manager Fax Number: 803-557-3996

DOE Project Manager e-mail address: sandra-l.johnson@srs.gov

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Savannah River**

Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site**

HQ ID: **0073**

Project **SR-SF06 / Alternate Technology Project**

General PBS Information

Is this a High Visibility Project (Y/N):

Planning Section

Baseline Costs (in thousands of dollars)

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006
PBS Baseline (current year dollars)	39,583	0	39,583	8,728	8,728	5,199	5,199	6,989	3,723	4,356	2,647	2,647	2,647	2,647	0
PBS Baseline (constant 1999 dollars)	37,802	0	37,802	8,728	8,728	5,199	5,199	6,989	3,594	4,059	2,401	2,338	2,277	2,217	0
PBS EM Baseline (current year dollars)	39,583	0	39,583	8,728	8,728	5,199	5,199	6,989	3,723	4,356	2,647	2,647	2,647	2,647	0
PBS EM Baseline (constant 1999 dollars)	37,802	0	37,802	8,728	8,728	5,199	5,199	6,989	3,594	4,059	2,401	2,338	2,277	2,217	0

	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS Baseline (current year dollars)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS Baseline (constant 1999 dollars)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (current year dollars)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Baseline Escalation Rates

Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **Savannah River** Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site** HQ ID: **0073**

Project **SR-SF06 / Alternate Technology Project**

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	3.60%	3.60%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%

2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%

Project Reconciliation

Project Completion Date Changes:

Previously Projected End Date of Project: 9/1/2006

Current Projected End Date of Project: 9/30/2005

Explanation of Project Completion Date Difference (if applicable):

Technology development complete, repository data, waste form criteria complete and the Treatment and Storage Facility projected to be on-line by 9/30/2005.

Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):	32,943	**Actual 1997 Cost:**	8,728	**Actual 1998 Cost:**	5,199
Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars):	19,016	**Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):**			513
Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	19,529				

Project Cost Changes

	Cost Adjustments	Reconciliation Narratives
Cost Change Due to Scope Deletions (-):		
Cost Reductions Due to Efficiencies (-):		
Cost Associated with New Scope (+):	4,346	First of it's kind process development, evolving repository standards / data requirements
Cost Growth Associated with Scope Previously Reported (+):		
Cost Reductions Due to Science & Technology Efficiencies (-):		
Subtotal:	23,875	

Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **Savannah River** Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site** HQ ID: **0073**

Project **SR-SF06 / Alternate Technology Project**

Project Reconciliation

Additional Amount to Reconcile (+):	0
Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	**23,875**

Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
Project Mission Complete	SR-SF06-3		9/1/2006								
Support NEPA decision process in regards the SR Site Specific EIS	SR-SF06-1		12/31/1999							Y	
Support Repository License Application	SR-SF06-2		3/31/2002							Y	
Project Start	SR-SF06-001		10/1/1996								
Complete LEF validation testing	SR-SF06-002		9/30/2000								
Project Complete	SR-SF06-003		9/30/2005								

Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Project Mission Complete	SR-SF06-3									Y	
Support NEPA decision process in regards the SR Site Specific EIS	SR-SF06-1									Y	
Support Repository License Application	SR-SF06-2									Y	
Project Start	SR-SF06-001			Y							
Complete LEF validation testing	SR-SF06-002										Complete L Experimental Facility (LEF)(melter) validation testing - pending FY2000 funding needs resolution
Project Complete	SR-SF06-003				Y						

Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **Savannah River** Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site** HQ ID: **0073**

Project **SR-SF06 / Alternate Technology Project**

Technology Needs

Site Need Code: SR99-6002

Site Need Name: Technology for Repository Storage of Spent Nuclear Fuels

Focus Area Work Package ID:

Focus Area Work Package:

Focus Area:

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both):

Technologies	Cost Savings (in thousands of dollars)	Range of Estimate

Related CCP Milestones	Related Waste Streams	Agree?	Change?
	01080: SNF-E - Fuel Group E, All Targets (cont.)	Y	N
	01081: SNF-F - Fuel Group F (cont.)	Y	N